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(54) **BOX BROOM SWEEPER WITH AN ADJUSTABLE BOTTOM SURFACE ATTACHMENT**

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E01H 1/05 (2006.01)

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CPC ***E01H 1/045*** (2013.01); ***E01H 1/047*** (2013.01); ***E01H 1/056*** (2013.01)

(58) **Field of Classification Search**
CPC E01H 1/02; E01H 1/04; E01H 1/045; E01H 1/047; E01H 1/05; E01H 1/056
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See application file for complete search history.

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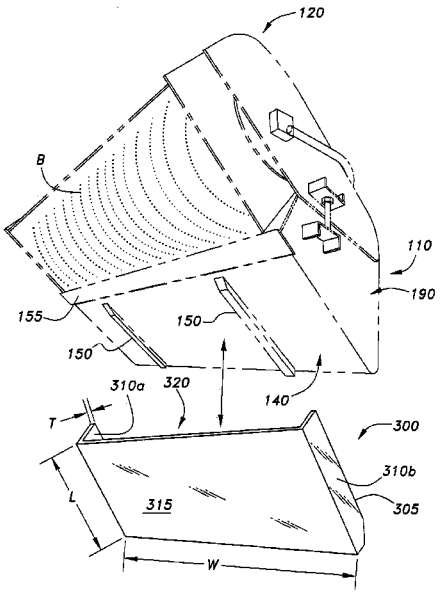
(57) **ABSTRACT**

The box broom sweeper with adjustable bottom surface attachment can include a box broom having a broom and a housing. The housing can include a top portion, a bottom portion having a guard, opposing front and rear ends, two opposing side walls connecting the top portion and the bottom portion, and an adjustable bottom surface attachment. The adjustable bottom surface attachment includes a plate and two opposing sides extending from the plate. The two opposing sides of the adjustable bottom surface attachment extend along corresponding side walls of the housing. The adjustable bottom surface attachment can be detachably coupled to the side walls of the housing to allow the adjustable bottom surface attachment to be detached when a front portion of the plate becomes damaged. The adjustable bottom surface attachment can be coupled to the box broom housing by welding.

6 Claims, 3 Drawing Sheets



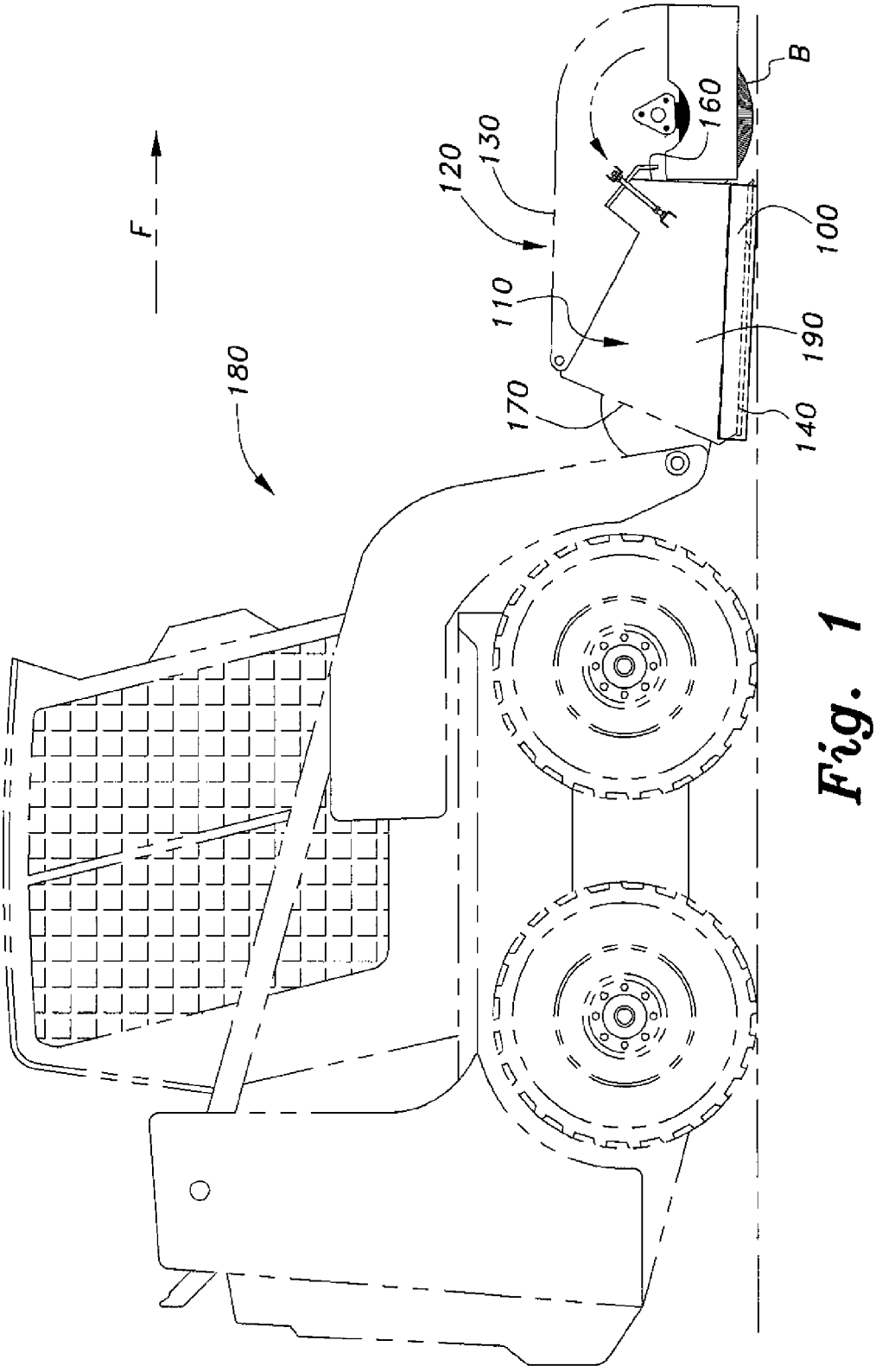


Fig. 1

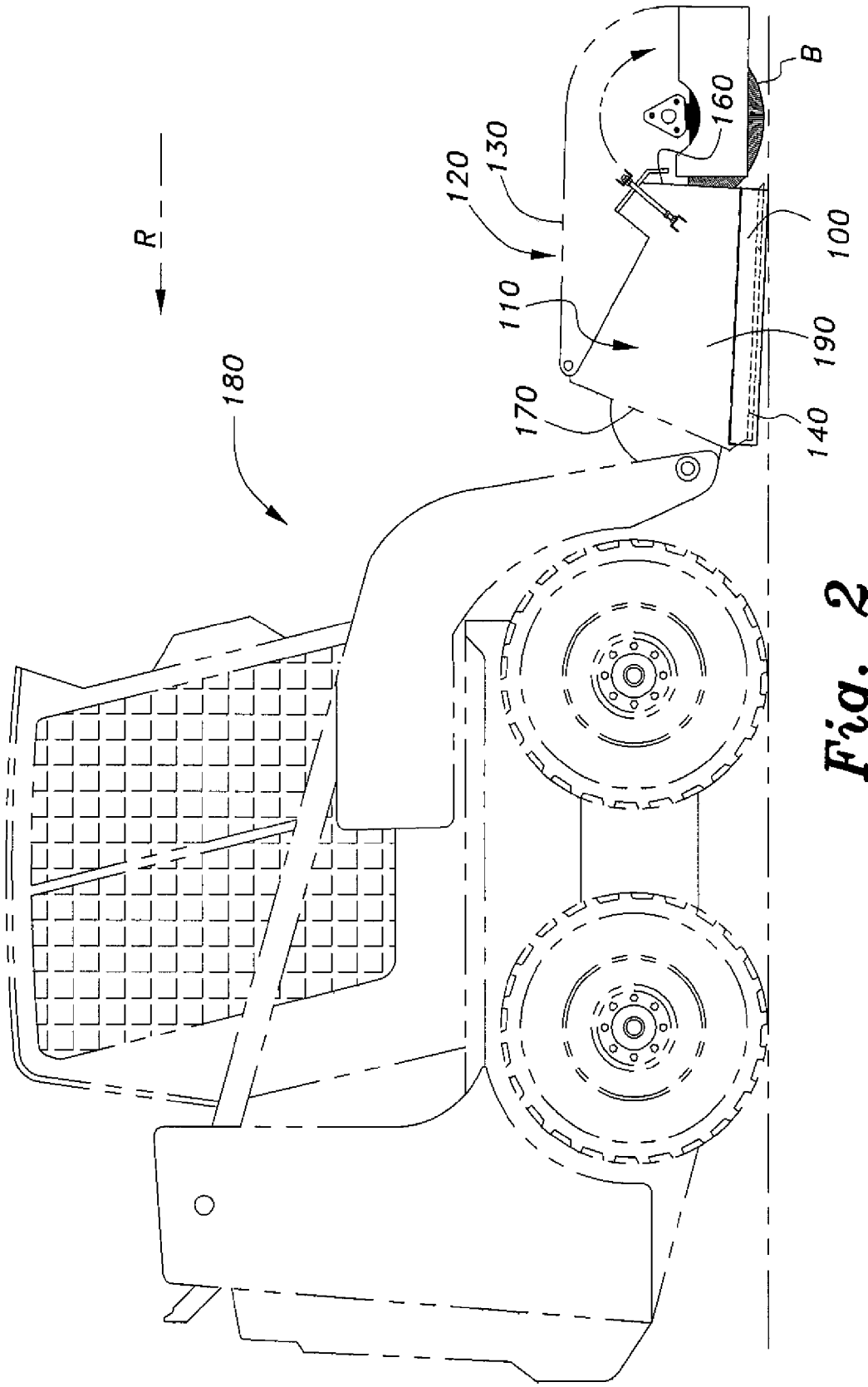


Fig. 2

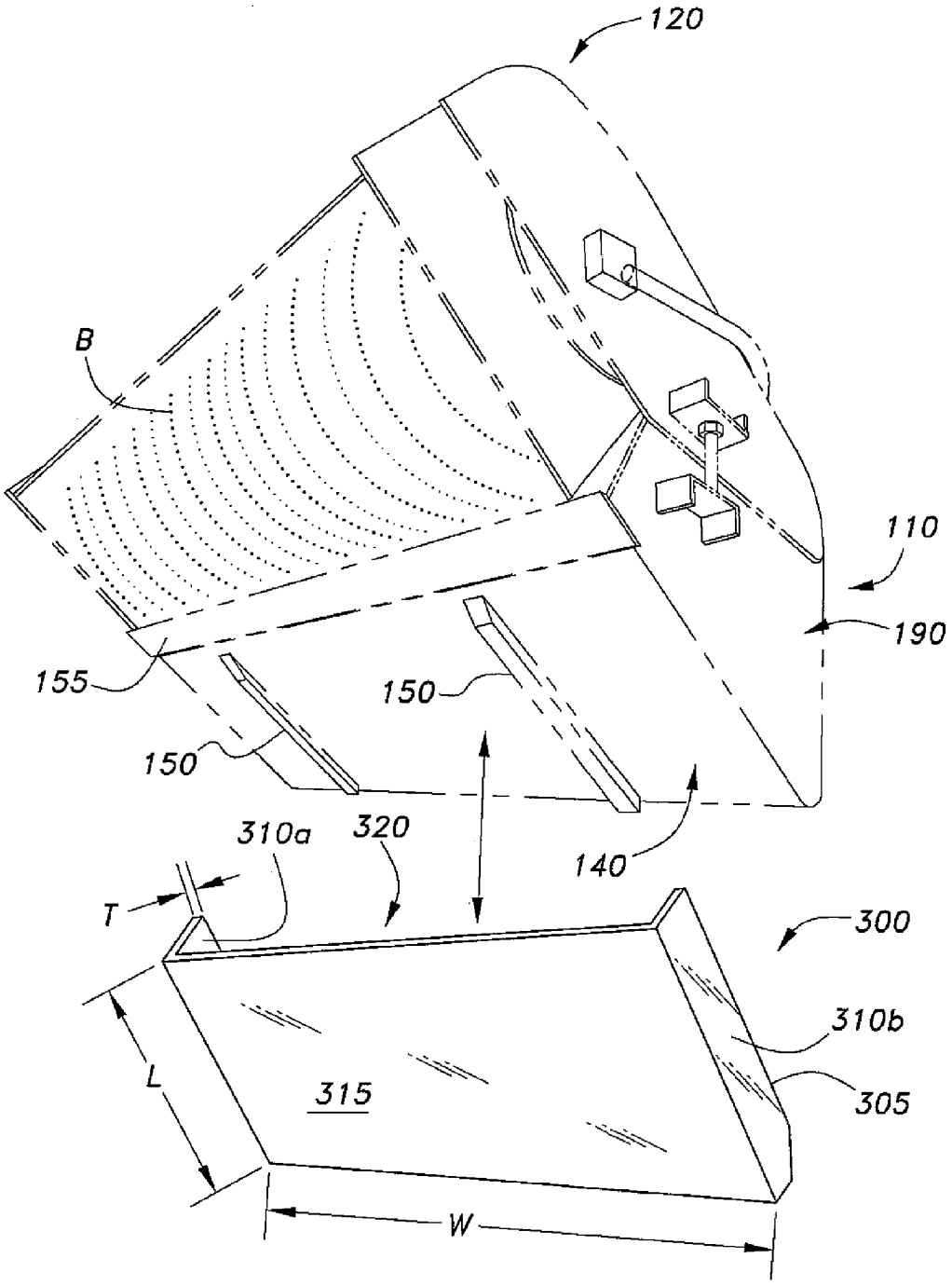


Fig. 3

BOX BROOM SWEEPER WITH AN ADJUSTABLE BOTTOM SURFACE ATTACHMENT

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention generally relates to street cleaning systems and more particularly to an adjustable bottom surface attachment for a box broom sweeper.

2. Description of the Related Art

Box brooms that are adapted to be attached to a vehicle, such as a skid-steer loader or skidsteer, have a variety of different uses. For example, box brooms can be used for general maintenance sweeping, such as picking up common gutter debris for basic street maintenance, or for picking up loose gravel, sand, small debris, or litter from airport roads, gates areas, and tarmac. Box brooms can also be used for cement plant cleanup, which includes picking up materials such as crushed lime, coke, and finished cement product. Typically the cost for each box broom ranges from approximately $6,000 USD to $8,000 USD.

The repeated use of the box broom in environments such as those described above not only damages the guard of the box broom, but also, and more importantly, causes the bottom of the box broom to become deleveled so as to allow loose gravel, sand, crushed lime, etc. to remain on the surface; thereby, rendering the box broom ineffective and unusable and forcing the user to purchase a new replacement box broom.

Thus, an adjustable bottom surface attachment for a box broom solving the aforementioned problems is desired.

SUMMARY OF THE INVENTION

The box broom sweeper with adjustable bottom surface attachment can include a box broom having a broom and a housing. The housing can include a top portion, a bottom portion having a guard, opposing front and rear ends, two opposing side walls connecting the top portion and the bottom portion, and an adjustable bottom surface attachment disposed over the bottom portion. The adjustable bottom surface attachment includes a plate and two opposing flanges or sides extending upward from the plate. The two opposing sides of the adjustable bottom surface attachment can be connected to the side walls of the housing and configured to extend at least partially along the side walls. The adjustable bottom surface attachment can be detachably coupled to the side walls of the housing to facilitate removal of the adjustable bottom surface attachment when the plate becomes worn down or damaged. The adjustable bottom surface attachment can be coupled to the box broom housing by welding.

These and other features of the present invention will become readily apparent upon further review of the following specification and drawings.

BRIEF DESCRIPTION OF THE DRAWINGS

FIG. **1** is an environmental, side view of a skid-steer loader having a box broom sweeper with adjustable bottom surface attachment according to the present invention, showing movement in a forward direction.

FIG. **2** is an environmental, side view of a skid-steer loader having a box broom sweeper with an adjustable bottom surface attachment according to the present invention, showing movement in a backwards direction.

FIG. **3** is an environmental, bottom, perspective view of the box broom sweeper with an adjustable bottom surface attachment, according to the present invention.

Unless otherwise indicated, similar reference characters denote corresponding features consistently throughout the attached drawings.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

An embodiment of a box broom sweeper with adjustable bottom surface attachment **100** includes a box broom **120** having a broom B and a housing **110**, as shown in FIGS. **1-3**. As shown more clearly in FIG. **3**, the box broom **120** includes an adjustable bottom surface attachment **300**. The box broom **120** can be configured in any suitable manner known in the art. For example, the box broom **120** can include a housing **110** having a top surface **130**, a bottom surface **140**, a front end **160**, a rear end **170**, and two opposing side walls **190**, connecting the top surface **130** and the bottom surface **140** of the housing **110**. The rear end **170** can be in communication with a vehicle **180**, such as a skid steer. As shown in FIG. **3**, the bottom surface **140** can have a plurality of skid plates **150** and a guard **155**. The housing **110** can be adapted to receive debris, such as sand, dirt, sticks, grass, small litter, loose gravel, small debris, as well as crushed lime, coke, and finished cement product swept up by the broom B.

As illustrated in FIG. **3**, the adjustable bottom surface attachment **300** includes a plate **315** having a front edge portion **320** and two opposing flanges or sides **305** extending from the plate **315**, e.g. normal to the plate **315**. Each of the two opposing sides **305** can include an inner face **310***a* and an outer face **310***b*. Each of the two opposing sides **305** are configured to extend at least partially along a respective side wall **190** of the housing **110**. The sides **305** can be connected to the box broom **120**, e.g., detachably connected, in any suitable manner, e.g., by welding. Alternatively, the adjustable bottom surface attachment **300** can be coupled to the box broom **120** by one or more suitable fasteners, such as bolts.

The adjustable bottom surface attachment **300** can be formed from any suitable material. The adjustable bottom surface attachment **300** can be made from steel, preferably T-1 steel. The adjustable bottom surface attachment **300** can be disposed over the bottom surface **140** of the housing **110** to protect the bottom surface **140**, e.g., the guard **155**, from becoming damaged as the box broom **120** is pushed forward F, as illustrated in FIG. **1**, or pulled in reverse R, as illustrated in FIG. **2**, to collect debris from a ground surface.

The adjustable bottom surface attachment **300** can be of any suitable size. For example, the width W of the adjustable bottom surface attachment **300** can be from about 60 inches to about 84 inches. The length L of the adjustable bottom surface attachment **300** can be from about 4 feet to about 6 feet. The thickness T of the adjustable bottom surface attachment **300** can be from about ⅞ inches to about one inch. The adjustable bottom surface attachment **300** can be configured to have dimensions appropriate to protect the bottom surface **140**, e.g., the guard **155**, from contact with a ground surface. The dimensions of the adjustable bottom surface attachment **300** can vary. The adjustable bottom surface attachment **300** can be configured to fit onto a variety of box brooms, such as box brooms having a width of 60 inches or a width of 84 inches.

As illustrated in FIG. **3**, by way of operation, the inner face **310***a* of each side wall **305** of the adjustable bottom surface attachment **300** can contact corresponding sides **190** of the housing **110**. The sidewalls **305** are coupled, e.g., removably coupled, to a corresponding side **190** of the housing **110** of the

box broom **120**. Each side **305** of the plate **315** of the adjustable bottom surface attachment **300** can be welded onto the corresponding side **190** of the housing **110** of the box broom **120**. Once the adjustable bottom surface attachment **300** is coupled to the housing **110**, the plate **315** covers the bottom surface **140**, including the guard **155** and the skid plates **150**. The front edge portion **320** of the bottom surface **140** can be aligned with the guard **155**. The adjustable bottom surface attachment **300** can be disposed over the bottom surface **140** of the housing **110**.

As the box broom **120** moves forward F (FIG. **1**) or in reverse R (FIG. **2**) on a surface to collect debris, the adjustable bottom surface attachment **300** can become damaged or thinner over time. A used or damaged adjustable bottom surface attachment **300** can be removed from the housing **110** and replaced with a new adjustable bottom surface attachment **300**. For example, the welds coupling each side **305** of the adjustable bottom surface attachment **100** to the sides **190** of housing **110** can be removed, e.g., by heating, cutting, or grinding down on the welds so as to detach the adjustable bottom surface attachment **300** from the housing **110**. If only the front portion **320** of the adjustable bottom surface attachment **300** is damaged, the damaged front portion **320** can be removed by removing the adjustable bottom surface attachment **300** from the box broom **120** and cutting the damaged portion off. A remainder of the adjustable bottom surface attachment **300** can include a front portion **320** with sufficient thickness to cover and protect the guard **155**. The remainder of the bottom surface attachment **300** can then be repositioned on and coupled to the housing **110**.

As an alternative to welding, it should be understood that any suitable attachment method known in the art can be used to detachably connect the adjustable bottom surface attachment **300** to the housing **110** of the box broom **120**. For example, a mounting rail can be provided on opposing side walls **190** which can be coupled to opposing flanges of the adjustable bottom surface attachment **300** with one or more fasteners. The mounting rail can facilitate repositioning and/or removal of the adjustable bottom surface attachment **300**.

It is to be understood that the present invention is not limited to the embodiments described above, but encompasses any and all embodiments within the scope of the following claims.

I claim:

1. A box broom sweeper with an adjustable bottom surface attachment comprising:

a box broom having a broom and a housing, the housing including a top surface, a bottom surface, a front end, a rear end, and two opposing side walls connecting the top surface and the bottom surface, the bottom surface including a guard; and

an adjustable bottom surface attachment detachably connected to the housing bottom surface, the adjustable bottom surface attachment including a plate having two opposing flanges extending upward from the plate, the two opposing flanges adapted to extend at least partially along the respective side walls of the housing.

2. The box broom sweeper with an adjustable bottom surface attachment according to claim **1**, wherein the adjustable bottom surface attachment is welded to the side walls of the housing.

3. The box broom sweeper with an adjustable bottom surface attachment according to claim **1**, wherein a width of the adjustable bottom surface attachment is about 60 inches to about 84 inches.

4. The box broom sweeper with an adjustable bottom surface attachment according to claim **1**, wherein a length of the plate is about 4 feet to about 6 feet.

5. The adjustable bottom surface attachment according to claim **1**, wherein a thickness of the plate is about ⅞ inches to about 1 inch.

6. The box broom sweeper with an adjustable bottom surface attachment according to claim **1**, wherein a front edge of the adjustable bottom surface attachment is aligned with the guard of the housing.

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